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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,171	09/28/2001	Katsuyuki Yamada	65988 CCD	5507

7590 05/16/2007

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EXAMINER	
ANGEBRANNDT, MARTIN J	

ART UNIT	PAPER NUMBER
1756	

MAIL DATE	DELIVERY MODE
05/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/966,171	YAMADA ET AL.	
	Examiner	Art Unit	
	Martin J. Angebranndt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12-14,17-25 and 33-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12-14,17-25 and 33-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The response of the applicant has been read and given careful consideration. Prosecution resumes due to the RCE filing 12/26/06. Responses to the arguments of the applicant are presented after the first rejection to which they are directed.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4,6-10,12-14,17-25 and 33-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. '025, in view of Ando et al. '543 and Hisotomi et al. WO 99/38168.

Yamada et al. '025 teaches optical recording media comprising a 1.2 mm substrate provided with 0.5 microns grooves having a depth of 35 nm coated with either AgInTeSb and AgInTeSbN which are recorded using 2x and **4x** CD recording velocities (2.4 and **4.8 m/s** respectively) and table 2 gives the recrystallization upper limit velocities. These have the structure of a polycarbonate substrate, a first ZnS-SiO_2 layer, a recording layer, a second ZnS-SiO_2 layer, an Al reflective layer and a resin overcoating. Example 2 has a uppermost recrystallization of 4.7 m/s, which is 0.97 x V_r (the standard 4X recording velocity). Example 6 has a uppermost recrystallization of 4.8 m/s, which is equal to V_r (the standard 4X recording velocity). The dielectric layers may be various materials including SiC, SiN, SiO and SiO_2, may be multilayered and may be formed by sputtering. (13/35-46) Note that figure 9 is identical to figure 19 of the instant specification. Substrate thicknesses of 0.6 or 1.2 mm with grooves 0.25 to 0.65 microns wide and 25-65 nm deep are disclosed. (10/3-11). **The examiner holds that**

the 4x rate is a standard rate for CD recording and this is supported by table 1 in column 11.

Ando et al. '543 disclose GeTeSb phase change optical recording media (RAM) (8/53-58). The lead-in area is disclosed as containing embossed information including linear velocity upon recording and erasure. (10/60-64)

Hisotomi et al. WO 99/38168 disclose GeTeSb phase change optical recording media (RAM) (page 6). The lead-in area is disclosed as containing embossed information including linear velocity upon recording and erasure. (paragraph bridging pages 7-8)

It would have been obvious to modify the examples of Yamada et al. '025 by including the various performance characteristics, such as uppermost recrystallization velocity (which is the highest velocity at which erasure takes placer) and the useful recorded velocities in the lead in area of the optical disc so that the disc is used under improper conditions as discussed by described Ando et al. '543 in column 8 and Hisotomi et al. WO 99/38168 on pages 6-8 as this is considered conventional to provide this information to the readout/recording system. Further, it would have been obvious to use a multilayers dielectric including SiN, Sio SiC or SiO_2 based up[on the direction to do so at 13/35-47 of Yamada et al.'025. The values of the uppermost recrystallization velocity are all fine for the double speed recording. Further, it would have been obvious to use to 0.6 mm substrate of DVD formats to gain the increased data capacity

The applicant argues that standard recording velocities are not taught. Standard recording velocities are multiplex of 1.2 m/sec, which is the CD 1X recording rate. Clearly, 2.4, 4.8 and 9.6 m/sec are among these standard velocities. The examples notes that 4.8 and 9.6 are taught in the instant specification at [0264] of the prepub. These are clearly recognized as

standard recording velocities in the industry and this is evidenced by their use in the references of record and table 1 in column 11 of Yamada et al.'025 (or Yamada et al. EP 1058249). As these media are used with these recording velocities, as well as slower standard speeds, the examiner has met a reasonable reading of the claims, noting that all media can be used at the 1X CD speed, that case where slower standard speeds are used are also met by the cited examples having the recited embossed information in the lead in area. Optical recording media maintain very tight tolerances with respect to speeds as even slight variations would mis-read a bit. The applicant may realize a benefit for particular speeds (very high), but the phrasing of the claims where the recrystallization velocity is at least 85% of the maximum or standard recording velocities merely seems to set forth a reasonable margin to ensure that as the performance of the medium degrades with time, the recording speed (for overwriting as well) will still be able to recrystallize (erase/overwrite) portion of the medium where this is desired.

The applicant agues on page 16 of the response that none of the references teach a third dielectric layer in the recited position. The examiner disagrees, noting the direction at column 13. at lines 42-43, which states that "each dielectric layer may be of a multiple-layered structure ..." of Yamada et al. '025 and so does teach the argued limitation as one of the layers would be a bilayer. The rejection stands.

4. Claims 1-10,12-14,17-25 and 33-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. EP 1058249, in view of Ando et al. '543 and Hisotomi et al. WO 99/38168.

Yamada et al. EP 1058249 teaches optical recording media comprising AgInTeSb and AgInTeSb(N,C,Ge) which are recorded using 4x and 8x CD rates (4.8 and 9.6 m/s respectively)

and table 1 gives the recrystallization upper limit velocities (ns should be m/sec as ns is a measure of time, not velocity and the range 5.2 to 9.9, is within the 5-10 m/sec described in the specification/abstract). These have the structure of a 1.2 mm polycarbonate substrate having grooves a width of 0.5 microns and a depth of 35 nm, a first ZnS-SiO_2 layer, a recording layer, a second ZnS-SiO_2 layer, an Al reflective layer and a resin overcoating. Example 5 has a uppermost recrystallization of 48.8 m/s, which is 0.97 x V_r (the standard 8X recording velocity (9.6 m/s)). Example 8 has a uppermost recrystallization of 9.9 m/s, which is equal to 1.03 x V_r (the standard 8X recording velocity (9.6 m/sec)). The dielectric layers may be various materials including SiC, SiN, SiO and SiO_2, may be multilayered and may be formed by sputtering [0056-0059]. Note that figure 9 is identical to figure 2 of the instant specification. The use of substrtate thicknesses of 0.6 or 1.2 mm is disclosed as is the use of groove widths of 0.25 to 0.65 microns and groove depths of 15-55 nm [0031].

It would have been obvious to modify the examples of Yamada et al. EP 1058249 by including the various performance characteristics, such as uppermost recrystallization velocity (which is the highest velocity at which erasure takes placer) and the useful recorded velocities in the lead in area of the optical disc so that the disc is used under improper conditions as discussed by described Ando et al. '543 in column 8 and Hisotomi et al. WO 99/38168 on pages 6-8 as this is considered conventional to provide this information to the readout/recording system. Further, it would have been obvious to use a multilayers dielectric including SiN, Sio SiC or SiO_2 based up[on the direction to do so at 13/35-47 of Yamada et al.'025. The values of the uppermost recrystallization velocity are all fine for the double speed recording. Further, it would have been obvious to use to 0.6 mm substrate of DVD formats to gain the increased data capacity

The applicant agues on page 16 of the response that none of the references teach a third dielectric layer in the recited position. The examiner disagrees, noting the direction at [0056-0059], which states that "each dielectric layer may be of a multiple-layered structure ..." of Yamada et al. EP 1058249 and so does teach the argued limitation as one of the layers would be a bilayer. The rejection stands.

5. Claims 1-10,12-14, 17-25 and 27-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over **either one of** (Yamada et al. '025 or Yamada et al. EP 1058249), in view of Yamada et al. '025, Ando et al. '543 or Hisotomi et al. WO 99/38168, further in view of Nonaka et al. EP 1001415.

Nonaka et al. EP 1001415 teaches the provision of boundary layers in contact with the phase change recording layer. These may be oxides, nitrides or carbides of group 3A through 6B of the second period of the periodic table, which includes Si and carbon [0024-0026]. The boundary layers prevent the diffusion of elements from the dielectric layers into the recording layer and enhances crystallization of the recording layer [0028-0030]. In particular the preventing of layers containing sulfur in contact with the recording layer is facilitated. [0007,0038]. The boundary layers can be 0.5 to 10 nm in thickness, preferably 0.5 to 4 nm. [0039-0041].

In addition to the basis above, to address the embodiments where the third dielectric layer is in contact with the recording layer, the examiner cites Nonaka et al. EP 100141, which establishes the desirability of using boundary layers with thicknesses of 0.5 to 10 nm of such materials as silicon oxides, SiC, carbon or silicon nitrides, to prevent the contact of sulfur containing layers with the recording layer at [0007,0028-0030 & 0038] and holds that it would

have been obvious to modify the media rendered obvious by **either one of** (Yamada et al. '025 or Yamada et al. EP 1058249), in view of Yamada et al. '025, Ando et al. '543 or Hisotomi et al. WO 99/38168 by forming one of the dielectrics as multilayered dielectric based upon the teachings of **either of** (Yamada et al. '025 or Yamada et al. EP 1058249), where the layers closest to the phase change recording layer is a boundary layer which prevents contact between the recording layer and the $ZnS\text{-}SiO_2$ dielectric layers with a reasonable expectation of gaining the advantages ascribed to this by Nonaka et al. EP 1001415.

6. Claims 1-10,12-14, 17-25 and 27-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. JP 2000-079761, in view of Nonaka et al. EP 1001415 combined with any of Yamada et al. '025, Ando et al. '543 or Hisotomi et al. WO 99/38168.

Yamada et al. JP 2000-079761 (machine translation attached) in example 3 has a polycarbonate substrate, 103 nm $ZnS\text{-}SiO_2$ layer, a 16 nm recording $Ag_{4.7}Ga_{4.7}Ge_{4.6}Sb_{61.3}Te_{24.7}$ layer, a 41 nm $ZnS\text{-}SiO_2$ layer, a 200 nm reflective layer and a protective layer which is embraced by the language of claim 27. [0042]. Note Ag is considered an impurity.

It would have been obvious to one skilled in the art to modify the teachings/media of Yamada et al. JP 2000-079761 by adding boundary layers on either of both sides of the recording layer as taught by Nonaka et al. EP 1001415 to prevent contact between the recording layer and the $ZnS\text{-}SiO_2$ dielectric layers with a reasonable expectation of gaining the advantages ascribed to this by Nonaka et al. EP 1001415 and embossing information concerning the linear velocities that the medium should be used at as taught by Ando et al. '543 or Hisotomi et al. WO 99/38168 and including the information on the uppermost recrystallization velocities taught by Yamada et al. '025 to enable the recording system to immediately use the medium at the proper powers and

rotational rates without testing with a reasonable expectation of success. Further, it would have been obvious to use to 0.6 mm substrate of DVD formats to gain the increased data capacity as taught by Yamada et al. '025.

7. Claims 1-10,12-14, 17-25 and 27-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nobukuni et al. EP 1056077, in view of Nonaka et al. EP 1001415 combined with any of Yamada et al. '025, Ando et al. '543 or Hisotomi et al. WO 99/38168.

Nobukuni et al. EP 1056077 in example 3 has a polycarbonate substrate, 100 nm ZnS-SiO_2 layer, a 20 nm recording $Ga_5Ge_5Sb_{68}Te_{22}$ layer, a 40 nm ZnS-SiO_2 layer, a 250 nm reflective layer and a protective layer which is embraced by the language of claim 27. [0464]. The addition of various materials including In, Ga, Si, Sn, Pb, Pd, Pt, Zn, Au, Ag, Zr, Hf, V, Nb, Ta, Cr, Co, Bi, N,O,S and rare earths as impurities to improve the performance and the reliability of the recording layer is disclosed [0073-0074].

It would have been obvious to one skilled in the art to modify the teachings/media of Yamada et al. JP 2000-079761 by adding boundary layers on either of both sides of the recording layer as taught by Nonaka et al. EP 1001415 to prevent contact between the recording layer and the ZnS-SiO_2 dielectric layers with a reasonable expectation of gaining the advantages ascribed to this by Nonaka et al. EP 1001415 and embossing information concerning the linear velocities that the medium should be used at as taught by Ando et al. '543 or Hisotomi et al. WO 99/38168 and including the information on the uppermost recrystallization velocities taught by Yamada et al. '025 to enable the recording system to immediately use the medium at the proper powers and rotational rates without testing with a reasonable expectation of success. Further, it would have

been obvious to use to 0.6 mm substrate of DVD formats to gain the increased data capacity as taught by Yamada et al. '025.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Martin J Angebranndt
Primary Examiner
Art Unit 1756

05/10/2007